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JACK ANDERSON

Arms-Treaty Compliance Hard to Verify

President Reagan meets today with Soviet Foreign Minister Andrei A. Gromyko. Some implacable anti-Soviet advisers wanted the president to confront Gromyko with charges that the Soviets have routinely violated arms agreements.

In fact, a report was prepared, accusing the Soviets of arms-treaty violations.

But the president has overruled the hotheads and stopped the release of the report. In too many cases, intelligence reports of Soviet violations are riddled with "ifs," "buts" and "maybes."

Equally experienced analysts can look at the same raw data and come to different conclusions: i.e., that the Soviets are violating arms-control treaties repeatedly or that they are keeping strictly to the letter of the treaty limits.

How is this possible? My associate Dale Van Atta investigated one classic example of confusing intelligence: the alleged Soviet violations of the 1974 Threshold Test Ban Treaty.

He examined top-secret CIA, Pentagon and National Security Council studies on the treaty. Here's what he found:

The treaty itself is simple. It bans underground testing of nuclear devices with a yield of more than 150 kilotons. Though both sides have yet to ratify the treaty, they signed it and agreed to abide by its provisions.

Unfortunately, the only way to measure the size of an underground explosion accurately is to have seismographs close to the blast site. The Soviet Union will not allow this, so the United States must resort to guesswork—sophisticated and scientific guesswork, but guesswork nonetheless.

Because U.S. seismic monitors are thousands of miles from Soviet test sites, the information must be compared with similar data obtained from U.S. and French tests of known kiloton yields. But as one secret NSC report noted, "the seismic waves from Soviet explosions travel through the earth . . . along paths very different from those of U.S. or French explosions."

Furthermore, U.S. estimates rely heavily on comparisons with data from the Nevada test site, although the geophysical conditions may be entirely different at the Soviets' Central Asian test site in Semipalatinsk.

The result is that the size estimate of Soviet test explosions—what scientists call the "central-value yield"—can be off by a factor of two. If the central-value yield is exactly 150 kilotons, for example, the actual size of the Soviet test bomb could be as low as 75 kilotons—or as high as 300 kilotons.

Since 1974, the United States has detected 18 Soviet test explosions that had a central-value yield of more than 150 kilotons. After 14 of these, the United States secretly delivered complaints to the Kremlin, but "given the uncertainties involved in our yield-estimation process," a secret report explained, the Soviets were not accused outright of violating the treaty. In each case, the Soviets replied that the tests were 150 kilotons or less.

There's no way U.S. scientists can contradict the Soviets with certainty. In one explosion—on Sept. 14, 1980—the central-value yield of 315 kilotons seemed to indicate that the Soviets had set off at least a 157-kiloton bomb, seven kilotons over the treaty threshold.

But since even the central-value yield limits are only a 95 percent probability, there was a 5 percent chance the blast was, in fact, 150 kilotons or lower.

To compound the uncertainty, the U.S. methodology used in 1974, when the treaty was signed, produced estimates 150 percent higher than the current system. That would mean the Soviets could have tested at least a 393-kiloton device four years ago, and possibly one as powerful as 1,574 kilotons.

But nobody knows if the current test-monitoring method is more valid than the one used in 1974, or if both are cockeyed.